

WHAT IS CLAIMED IS:

1 1. A design method for a bus system equipped with
2 a plurality of device units, a data bus on which said device
3 units are connectible, a timing-signal supply source for
4 supplying a timing signal to said device units through
5 a timing-signal bus, a bus switch for connecting and
6 disconnecting a signal between the device unit and said
7 data bus, and a bus-switch control part for controlling
8 the connecting and disconnecting operations of said bus
9 switch,

10 said design method comprising:

11 a noise propagation computation step of
12 computing, based on a cycle of said timing signal, a signal
13 propagation delay in the device unit, signal propagation
14 delays in said timing-signal bus and said data bus, and
15 a setup time in the device unit or device connected on
16 said data bus, timing at which, when the device unit is
17 connected on said data bus being active, noise propagates
18 to the remaining device units other than said connected
19 device unit or to said device connected on said data bus;
20 and

21 a connection timing computation step of
22 computing, based on said timing computed in said noise
23 propagation computation step, connection timing at which
24 said device unit is connected on said data bus.

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1 2. The design method as set forth in claim 1, wherein
2 in said connection timing computation step said connection
3 timing is computed by computing a delay time "b" needed
4 for said bus switch to connect said device unit on said
5 data bus after said device unit is connected on said
6 timing-signal bus.

1 3. The design method as set forth in claim 1,
2 wherein:

3 in said noise propagation computation step, a
4 timing margin $M \{= (T + g) - (a + b + c + d + e + f) -$
5 $S\}$ between arrival of said noise at the device units other
6 than the connected device unit or device connected to said
7 data bus and start of said setup time is computed as
8 propagation timing of said noise, based on cycle "T" of
9 said timing signal, skew "a" from said timing-signal supply
10 source to said bus switch control part, delay time "b"
11 of said bus switch, signal propagation delay time "c"
12 between said bus switch control part and said bus switch,
13 operating delay time "d" of said bus switch, pulse width
14 (time) "e" of said noise, propagation delay time "f" of
15 said noise in said connected device unit and said data
16 bus, skew "g" from said timing-signal supply source to
17 the device units other than said connected device unit
18 or device connected on said data bus, and setup time "S"
19 in said bus system; and

20 in said connection timing computation step, the

21 delay time "b" of said bus switch is computed so that said
22 timing margin M is 0 or greater.

1 4. A bus system comprising:
2 a plurality of device units;
3 a data bus on which said device units are
4 connectible;
5 a timing-signal supply source for supplying a
6 timing signal to said device units through a timing-signal
7 bus, a bus switch for connecting and disconnecting a signal
8 between the device unit and said data bus; and
9 a bus-switch control part for controlling the
10 connecting and disconnecting operations of said bus
11 switch;
12 wherein said bus-switch control part controls
13 said bus switch so that the device unit is connected on
14 said data bus after a delay time "b" of said bus switch
15 from connection of said device unit with said timing-signal
16 bus;
17 and wherein, based on cycle "T" of said timing
18 signal, skew "a" from said timing-signal supply source
19 to said bus switch control part, the delay time "b" of
20 said bus switch, signal propagation delay time "c" between
21 said bus switch control part and said bus switch, operating
22 delay time "d" of said bus switch, pulse width (time) "e"
23 of noise caused when the device unit is connected on said
24 data bus being active, propagation delay time "f" of said

25 noise in the device unit and said data bus, skew "g" from
26 said timing-signal supply source to the device units other
27 than the connected device unit or device connected on said
28 data bus, and setup time "S" in said bus system, the delay
29 time "b" of said bus switch is computed as a value such
30 that a timing margin $M \{= (T + g) - (a + b + c + d + e$
31 $+ f) - S\}$ from arrival of said noise at the device units
32 other than the connected device unit or said device to
33 start of said setup time is 0 or greater.

1 5. A device unit connectible to a printed-circuit
2 board equipped with a data bus, a timing-signal supply
3 source, and a timing-signal bus connected to said
4 timing-signal supply source, comprising:

5 a bus switch for connecting and disconnecting
6 a signal between said device unit and said data bus; and

7 a bus-switch control part for controlling the
8 connecting and disconnecting operations of said bus
9 switch;

10 wherein said bus-switch control part controls
11 said bus switch so that the device unit is connected on
12 said data bus after a delay time "b" of said bus switch
13 from connection of said device unit with said timing-signal
14 bus;

15 and wherein, based on cycle "T" of said timing
16 signal, skew "a" from said timing-signal supply source
17 to said bus switch control part, the delay time "b" of

18 said bus switch, signal propagation delay time "c" between
19 said bus switch control part and said bus switch, operating
20 delay time "d" of said bus switch, pulse width (time) "e"
21 of noise caused when the device unit is connected on said
22 data bus being active, propagation delay time "f" of said
23 noise in the device unit and said data bus, skew "g" from
24 said timing-signal supply source to device units other
25 than the connected device unit or device connected on said
26 data bus, and setup time "S" in said bus system, the delay
27 time "b" of said bus switch is computed as a value such
28 that a timing margin $M \{ = (T + g) - (a + b + c + d + e$
29 + f) - S\} from arrival of said noise at the device units
30 other than the connected device unit or said device to
31 start of said setup time is 0 or greater.